SUPER●®

SUPER X5DPL-TGM

USER'S MANUAL

Revision 1.0

Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER X5DPL-TGM mainboard. The SUPER X5DPL-TGM supports single or dual Intel® 604/603-pin Xeon™ 512K L2 cache processors at a 533 MHz front side bus. Please refer to the support section of our web site (http://www.supermicro.com/TechSupport.htm) for a complete listing of supported processors. This product is intended to be professionally installed.

Manual Organization

Chapter 1 begins with a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when you want to install the processor and memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, SCSI drives, the IDE interfaces, the parallel and serial ports, the keyboard and mouse, the power supply and various other connections, buttons and indicators.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ [Frequently Asked Questions] section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site (at www.supermicro.com/techsupport.htm) for more detailed information.

Chapter 4 includes an introduction to PhoenixBIOS and provides detailed information on running the CMOS Setup utility.

Appendix A gives information on PhoenixBIOS POST messages.

Appendix B provides BIOS POST codes.

Appendix C lists software programs and the OS installation instructions.

Table of Contents

Chapter 3: Troubleshooting

Chapter 4: PhoenixBIOS

Appendices:

Chapter 1
Introduction

1-1   Overview

Checklist

Congratulations on purchasing your computer motherboard from an ac-
knowledged leader in the industry. Supermicro boards are designed with
the utmost attention to detail to provide you with the highest standards in
quality and performance.

Please check that the following items have all been included with your
motherboard. If anything listed here is damaged or missing, contact your
retailer.

One (1) Supermicro Mainboard

One (1) ribbon cable for IDE devices

One (1) floppy ribbon cable

One (1) USB cable (*For retail only)

One (1)COM Port w/Cable (*For retail only)

One (1) I/O backpanel shield

One (1) Supermicro CD or diskettes containing drivers and utilities

One (1) User's/BIOS Manual

Two (2) Pentium 4 Xeon active heatsinks (FAN-042-CF) (*For retail
only)

Two (2) heatsink retention clips (SKT-095-604E)

Eight (8) SATA cables (*For retail only)

Contacting Supermicro

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Notes

Figure 1-3.   SUPER X5DPL-TGM Image
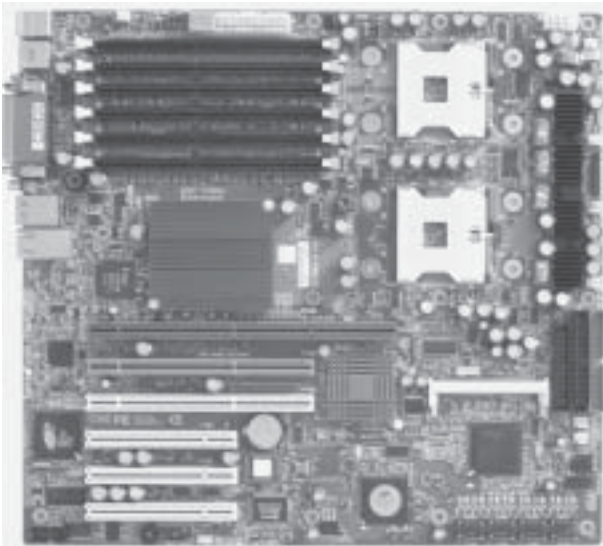
Figure 1-4. SUPER X5DPL-TGM Layout*
(not drawn to scale)

Keyboard Mouse J28
Ch Fan3
JP40 PWR ON
J34
ATX PWR CONN
J15 8-PINPWR CONN

USB0/1
J10/J11
J8
COM1
Parallel Port
VGA
J29
J4

Mb LAN
J1 JLAN2
Gb LAN
JLAN1

SUPER® X5DPL-TGM

DIMM #1A
DIMM #1B
BANK 1
DIMM #2A
DIMM #2B
BANK 2
DIMM #3A
DIMM #3B
BANK 3

CPU 1

MCH
(North Bridge)

CPU 2

82545EM
Gb LAN Controller

GLAN Enable
JD3
Mb LAN Controller
JP3
Mb LAN Enable
Rage XL

133 MHz PCI-X #6
SXB
Zero Channel RAID Ready
100 MHz PCI-X #5
100 MHz PCI-X #4
33 MHz PCI #3
Battery
33 MHz PCI #2
BIOS
USB
33 MHz PCI #1
JP4 VGA Enable
Super I/O

ICH3
(South Bridge)

JP39
CPU Clock

OH LED
JOH1

SMB
JP24
IPMI

ICH3

JPS1
SATA Enable
Marvell 88SX5081
SATA Controller

Ch Fan 1
PWR Fault JP8
3rd PS Alarm RST JP36
JP9
3rd PS Alarm Enable

CPU1 ChFan

Front Panel CTL
JF2

CPU2 ChFan

Ch Fan 2
JP37
WD
JP7
J3 J2

FLOPPY
IDE #2
IDE #1

J24
SMB Switch
J22
ChFan4
ChFan5

CHAS Intrusion
JL1
FPUSB0/1 J27
USB2
JD2
JS5
SATA ACT LED

JS2 JS4 JS7 JS9
SATA#1 SATA#3 SATA#5 SATA#7
SATA#0 SATA#2 SATA#4 SATA#6
JS1 JS3 JS6 JS8

J26 COM2
SPKR
PWRLED/SPKR WOL1
JD1
CL CMOS
JP35
JBT1 Keylock

Notes:

*The IPMI socket is an optional feature.

*Jumpers not noted are for test purposes only.

*" ■ " = Pin 1

X5DPL-TGM Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	See Section 2-6
JD3/JP3	Mb(JP3)LAN/GLAN(JD3)Enable	Pins 1-2 (Enabled)
JP4	VGA Enable/Disable	Pins 1-2 (Enabled)
JP9	Third Power Supply Fail Enable	Open (Disable)
JP36	3rd PWR Supply Alarm Reset	Open (Disabled)
JP37	Watch Dog	Close (Enabled)
JP39	CPU Clock	Pins 1-2 (Auto)
JP40	Force-Power On	Open (Normal)
JPS1	SATA Enable	Pins 1-2 (Enabled)

Connector	Description
ATX PW CONN(J34)	Primary ATX Power Connector
DIMM#1A-DIMM#3B	Memory (RAM) Slots
COM1(J8)/COM2(J26)	COM1/COM2 Serial Port Connector
CPU/Chassis FAN	CPU/Chassis Fan Header
Gb LAN/Mb LAN	Gigabit LAN(JLAN1)/Megabit LAN(J1)Ports
FPUSB4(J27)	Front Side USB4 Header
USB0/1(J10/J11)	USB 0/1 Headers
USB2(JD2)	USB2/3 Headers
IDE #1/#2 (J2, J3)	Hard Disk Drive Connectors
IPMI(J22)	IPMI Connectors
J28	PS/2 Keyboard/Mouse Ports
J15**	Processor Power Connector
JP24	SMB Switch Header
J29	Parallel (Printer) Port
JD1	PWR LED Header/Speaker Header/Jumper
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP8	Power Fault Header
JP35	Keylock Switch Connector
JS1-4, JS6-9	SATA#1-4, SATA#5-8 Connectors
JS5	SATA ACT_LED
JWOR1	Wake-on-Ring Header
Speaker	Onboard Speaker Header
VGA(J4)	VGA Display (Monitor) Port
WOL	Wake-on-LAN Header

** The 12v 8-pin CPU PWR connector (J15) must be connected

Motherboard Features

CPU
- Single or dual Intel® 604/603-pin Xeon™ 512K L2 cache processors at a 533/400 MHz front side (system) bus speed.

  Note: Please refer to the support section of our web site for a complete listing of supported processors (http://www.supermicro.com/TechSupport.htm).

Memory
- Six 184-pin DDR DIMM sockets supporting up to 12 GB of registered ECC DDR-266/200 (PC2100/1600) SDRAM

Chipset
- Intel E7501 (Plumas) chipset

Expansion Slots
- One 64-bit, 133 MHz PCI-X
- Two 64-bit, 100 MHz PCI-X
- Three 32-bit, 33 MHz PCI

BIOS
- 4 Mb Phoenix® Flash ROM
- APM 1.2, DMI 2.1, PCI 2.2, ACPI 1.0, Plug and Play (PnP), SMBIOS 2.3

PC Health Monitoring
- Onboard voltage monitors for CPU cores, chipset voltage, 3.3V, +5V, +12V and 3.3V standby
- Fan status monitor with firmware/software on/off control
- CPU/chassis temperature monitors
- Environmental temperature monitor and control
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- CPU overheat LED header
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU core
- Chassis intrusion detection
- System resource alert

ACPI/PC 98 Features (optional)
* Microsoft OnNow
* Slow blinking LED for suspend state indicator
* Main switch override mechanism
* External modem ring-on

Onboard I/O
* Integrated ATI Rage XL graphics controller
* One Intel 82551 10/100 Mb fast Ethernet and one Intel 82545EM Gb Ethernet port
* 2 EIDE Ultra DMA/100 bus master interfaces
* 1 floppy port interface (up to 2.88 MB)
* 2 Fast UART 16550A compatible serial ports
* 1 EPP/ECP Parallel Port (Enhanced Parallel Port/Extended Capabilities Port)
* PS/2 mouse and PS/2 keyboard ports
* Two USB (Universal Serial Bus) ports, three USB headers (USB 1.1)
* Eight SATA (Serial ATA) connectors (4 out 8 SATA connectors can be configured as RAID ports.)

Other
* Internal/external modem ring-on
* Recovery from AC power loss control
* Wake-on-LAN (WOL)
* Console redirection
* IPMI (optional)

CD/Diskette Utilities
* BIOS flash upgrade utility
* Device drivers

Dimensions
* Extended ATX, 12" x 13.05" (304.8 x 331.5 mm)

**Figure 1-5.   Intel E7501 Chipset:
System Block Diagram**
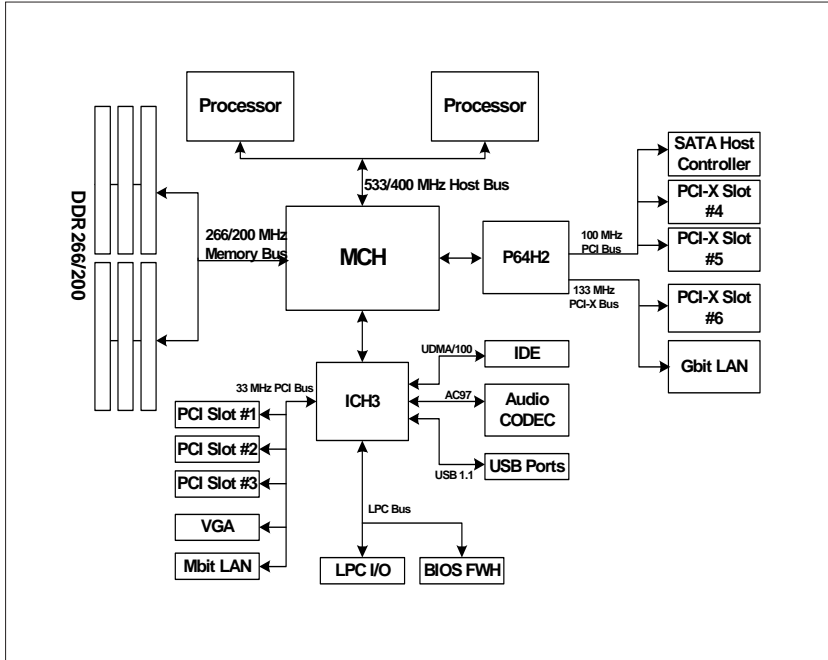
Notes:

1. This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of the motherboard.

a. All PCI slots are connected to ICH3.
b. PCI-X Slot4 and PCI-X Slot5 run on 100 MHz bus on P64H2.
c. PCI-X Slot6 shares 133 MHz bus on P64H2 with Gbit LAN.

1-2A Chipset Overview

The Intel E7501 (Plumas) chipset is a high-performance chipset with a performance and feature-set designed for mid-range, dual processor servers. The E7501 chipset consists of four major components: the Memory Controller Hub (MCH), the I/O Controller Hub 3 (ICH3), the PCI-X 64-bit Hub 2.0 (P64H2) and the 82808AA Host Channel Adapter (VxB).

The MCH has four hub interfaces, one to communicate with the ICH3 and three for high-speed I/O communications. The MCH employs a 144-bit wide memory bus for a DDR-200 memory interface, which provides a total bandwidth of 3.2 GB/s. The ICH3 interface is a 266 MB/sec point-to-point connection using an 8-bit wide, 66 MHz base clock at a 4x data transfer rate. The P64H2 interface is a 1 GB/s point-to-point connection using a 16-bit wide, 66 MHz base clock at a 8x data transfer rate.

The ICH3 I/O Controller Hub provides various integrated functions, including a two-channel UDMA100 bus master IDE controller, USB host controllers, an integrated LAN controller, a System Management Bus controller and an AC'97 compliant interface.

The P64H2 PCI-X Hub provides a 16-bit connection to the MCH for high-performance I/O capability and two 64-bit PCI-X interfaces.

1-2B Marvell 88SX5081 Host Controller Overview

The Marvell 88SX5081 device is a PCI/PCI-X to Serial ATA (SATA) host controller with expansion ROM interface. Based upon the SATA interface specification, the 88SX5081 device provides solutions for designs based on chipsets that do not integrate a SATA host controller.

Serial ATA(SATA) Interface

- 8-Port 1.5 Gbps SATA
- Compliant with SATA rev. 1.0 specifications
- Compliant with ATA-6 specifications
- Up to 32 Outstanding commands
- Supports device 48-bit addressing
- Supports SATA Power Saving Mode
- With Hot-swap capability

- Enhanced-DMA (EDMA) per SATA port
- Automatic command execution without host intervention
- 64-bit addressing support for descriptions and data buffers in system memory
- 512-byte buffer for read and write transactions per SATA port
- Read ahead
- Interrupt coalescing (one interrupt or less per I/o transaction)

64-bit PCI/PCI-X Interface

- PCI 2.2 Compliant 32/64-bit bus, up to 66 MHz
- PCI-X Rev. 1.0 Compliant 32/64-bit bus, up to 133MHz
- Supports 64-bit addressing via Dual Address Cycle (DAC) Transactions
- Compliant with PCI Power Management (PMG)

Features

- Supports up to two outstanding delayed read transactions (PCI 2.2)
- Supports up to four split transactions (PCI-X)
- Supports UP TO 4 MB expansion ROM for add-in cards
- Serial EPROM initialization interface

Figure 1-6. Marvell 88SX5081Host Controller Block Diagram
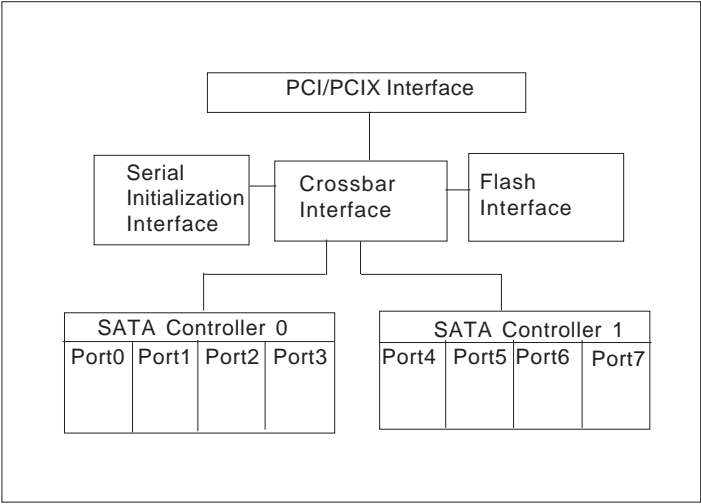
1-3   Special Features

ATI Graphics Controller

The X5DPL-TGM has an integrated ATI video controller based on the Rage XL graphics chip. The Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

BIOS Recovery

The BIOS Recovery function allows you to recover your BIOS image file if the BIOS flashing procedure fails (see Section 3-3).

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Peripheral Device Configuration) to change this setting. The default setting is Always On.

1-4   PC Health Monitoring

This section describes the PC health monitoring features of the SUPER X5DPL-TGM. The motherboard has an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, +3.3V, +5V, +12V and +3.3V Standby

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware/Software On/Off Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 3-pin CPU and chassis fans are controlled by the power management functions. The thermal fan is controlled by the overheat detection logic.

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a threshold. The overheat circuitry runs independently from the CPU. It can continue to monitor for overheat conditions even when the CPU is in sleep mode. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal control fan to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat LED

JOH1 is a header used to connect to a CPU overheat LED. When the CPU temperature becomes too high, both the overheat fan and the warning LED are activated.

System Resource Alert

This feature is available when used with Intel's LANDesk Client Manager (optional). LDCM is used to notify the user of certain system events. For example, if the system is running low on virtual memory and there is insufficient hard drive space for saving the data, you can be alerted of the potential problem. Auto-Switching Voltage Regulator for the CPU Core

The auto-switching voltage regulator for the CPU core can support up to 20A current and auto-sense voltage IDs ranging from 1.4V to 3.5V. This will allow the regulator to run cooler and thus make the system more stable.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 2000 and Windows NT 5.0.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, updates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboards have a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-Lan can only be used with an ATX 2.01 (or above) compliant power supply.

1-6   Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The SUPER X5DPL-TGM accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 400W of power and includes the additional +12V, 8-pin power connector - an even higher wattage power supply is recommended for high-load configurations. Also your power supply must provide 1.5A, which is needed for the LAN port(s).

NOTE: The processor 12v power connector (J15) is necessary to support Intel Xeon CPUs. Failure to provide this extra power will result in the CPUs becoming unstable after only a few minutes of operation. See Section 2-5 for details on connecting the power supply cables.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a

power surge protector to help avoid problems caused by power surges.

1-7   Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system.
Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP) , Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Chapter 2
Installation

2-1 Static-Sensitive Devices

Electric-Static-Discharge (ESD) can damage electronic components. To pre-vent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

• Use a grounded wrist strap designed to prevent static discharge.
• Touch a grounded metal object before removing the board from the anti-static bag.
• Handle the board by its edges only; do not touch its components, periph-eral chips, memory modules or gold contacts.
• When handling chips or modules, avoid touching their pins.
• Put the motherboard and peripherals back into their antistatic bags when not in use.
• For grounding purposes, make sure your computer chassis provides ex-cellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

2-2   PGA Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heat sink.

1. Locate the following components, which are included in the shipping package. The amounts shown are for each CPU.

Clips (2)

Retention brackets (2)

Screws* (4)

Black anchors (4)
White pegs (4)
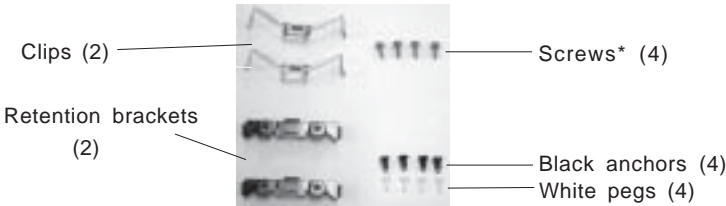
*These screws are for mounting the motherboard to the back panel of a chassis that has four mounting holes (as shown on right).
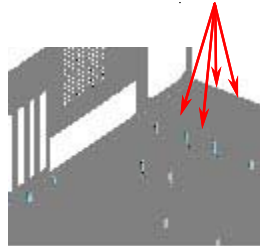
For chassis that do not have four mounting holes, use the anchor/peg assemblies:

2. Insert the white pegs into the black anchors. Do not force the white pegs all the way in - only about 1/3 of the way into the black anchors.

3. Place a retention bracket in the proper position and secure it by pressing pegs into two of the retention holes until you hear a *click*. The clicking sound indicates that the peg is locked and secured.

Anchor/peg assemblies

Two pegs in position

One retention bracket in position

4. Secure the other retention bracket into position by repeating Step 3.

5. Lift the lever on the CPU socket: *lift the lever completely or you will damage the CPU socket when power is applied. (Install CPU1 first.)*

Socket lever

6. Install the CPU in the socket. Make sure that pin 1 of the CPU is seated on pin 1 of the socket (both corners are marked with a triangle). When using only one CPU, install it into CPU socket #1 (CPU socket #2 is automatically disabled if only one CPU is used).

Pin 1

7. Press the lever down until you hear it *click* into the locked position.

Socket lever in locked position

Heatsink

8. Apply the proper amount of thermal glue to the CPU die and place the heatsink and fan on top of the CPU.

CPU

9. Secure the heatsink by locking the retention clips into their proper position.

Retention clip

CPU fan wires

10. Connect the three wires of the CPU fan to the respective CPU fan connector.

CPU fan connector

Figure 2-1. PGA604 Socket: Empty and with Processor Installed

Pin 1   Lever
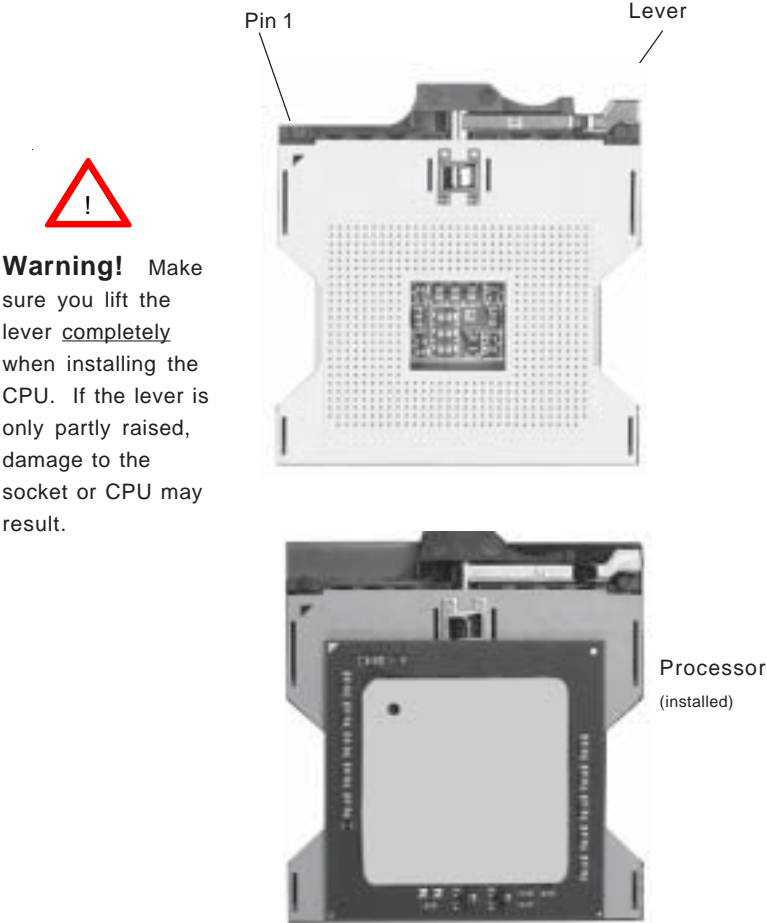
Warning! Make sure you lift the lever <u>completely</u> when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.

Processor
(installed)

Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure the location of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-3 Installing DIMMs

Note: Check the Supermicro web site for recommended memory modules:
http://www.supermicro.com/TECHSUPPORT/FAQs/Memory_vendors.htm

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CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

DIMM Installation (See Figure 2-2)

1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, then Bank 3.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support

The X5DPL-TGM only supports ECC registered PC2100/1600 (DDR-266/200) memory. PC100/133 SDRAM is not supported.
If DDR-266 memory is used with a 400 MHz FSB processor(s), it will only run at 200 MHz speed.

Figure 2-2. Installing and Removing DIMMs
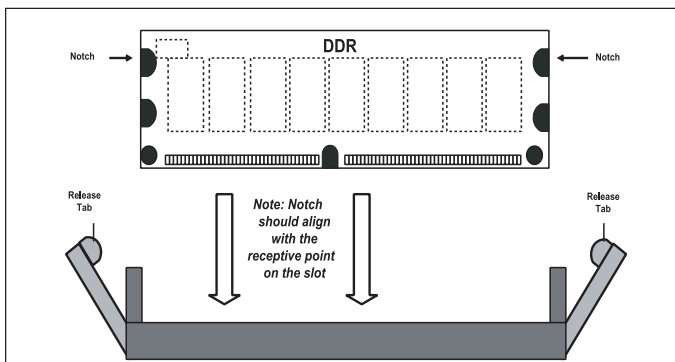
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the notches.

Top View of DDR Slot

Release Tab   Release Tab
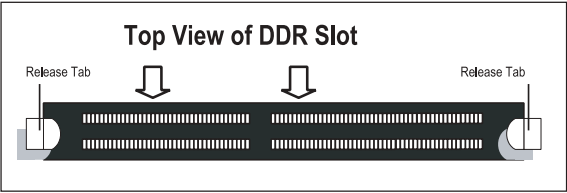
To Remove:
Use your thumbs to gently push near the edge of both ends of
the module. This should release it from the slot.

2-4 I/OPorts/Control Panel Connectors

The I/O ports are color coded in conformance with the PC 99 specification.
See Figure 2-3 below for the colors and locations of the various I/O ports.

Figure 2-3. I/O Port Locations and Definitions

Mouse
(Green)   Parallel Port (Burgundy)

Keyboard   USB Ports   COM1 Port   VGA (Monitor)   MbLAN GbLAN
(Purple)   (Turquoise)   Port (Blue)
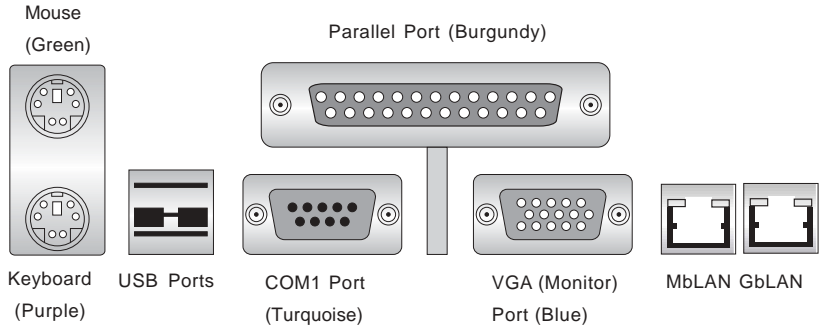
Note: COM2 is a header located on the motherboard - see the motherboard
layout pages in Chapter 1 for location.

Front Control Panel

JF2 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed especially for use with Supermicro server chassis. See Figure 2-4 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

Figure 2-4. JF2 Header Pins

```
                          JF2
                       20    19
          Ground  {    ○     ○    NMI ON
               X  {    ○     ○    X
             VCC  {    ○     ○    PW LED
             VCC  {    ○     ○    HDD
             VCC  {    ○     ○    NIC 1
             VCC  {    ○     ○    NIC2
             VCC  {    ○     ○    OH
             VCC  {    ○     ○    PS Fail
          Ground      ○     ○    Reset  }  Reset Button
          Ground      ○     ○    Pwr    >  Power Button
                       2     1
```
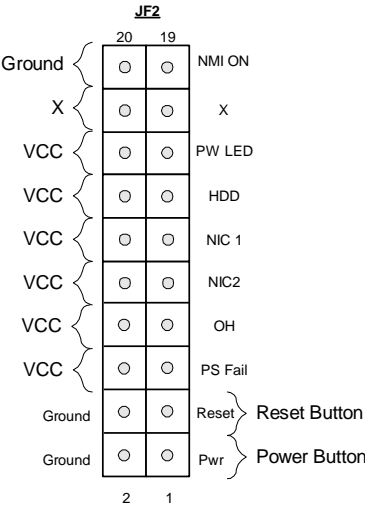
2-5   Connecting Cables

ATX Power Connector

The main power supply connector meets the SSI (Superset ATX) 24-pin specification, however it also supports a 20-pin power supply connector. Make sure that the orientation of the PS connector is correct.

ATX Power Supply 24-pin Connector Pin Definitions (J34)

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connector

In addition to the Primary ATX power connector (above), the 12v 8-pin Processor Power Connector at J15 must also be connected to your power supply. See the table on the right for pin definitions.

Processor Power Connector (J15)

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF2. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF2)

Pin Number	Definition
19	Ground
20	Control

Power LED

The Power LED connection is located on pins 15 and 16 of JF2. Refer to the table on the right for pin definitions.

PWR_LED Pin Definitions (JF2)

Pin Number	Definition
15	Vcc
16	Control

HDD LED

The HDD LED (for IDE Hard Disk Drives) connection is located on pins 13 and 14 of JF2. Attach the IDE hard drive LED cable to these pins to display disk activity. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF2)

Pin Number	Definition
13	Vcc
14	HD Active

NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF2. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF2)

Pin Number	Definition
11	Vcc
12	GND

NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF2. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF2)

Pin Number	Definition
9	Vcc
10	GND

Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF2 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

Overheat (OH) LED Pin Definitions (JF2)

Pin Number	Definition
7	Vcc
8	GND

Power Fail Button

The Power Fail Button connection is located on pins 5 and 6 of JF2. Refer to the table on the right for pin definitions.

Power Fail Button Pin Definitions (JF2)

Pin Number	Definition
5	Vcc
6	GND

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF2. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Pin Definitions (JF2)

Pin Number	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF2. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Connector Pin Definitions (JF2)

Pin Number	Definition
1	PW_ON
2	Ground

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Universal Serial Bus (USB0/1)

Two Universal Serial Bus ports (J10/J11) are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions

USB0		USB1	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

Extra Universal Serial Bus Headers

Three USB headers:FPUSB0/1(JD2) and USB2(J27) are included on the motherboard. FPUSB0/1 were designed to provide front side USB access. You will need a USB cable (not included) for these headers. Refer to the tables on the right for pin definitions.

USB2 Pin Definitions (JD2)

Pin Number	Definition
2	Power
4	-
6	+
8	Ground
10	Key

Serial Ports

The COM1(J8) serial port is located under the parallel port (see Figure 2-3). See the table on the right for pin definitions. The COM2 (J26) connector is a header located near the PCI-X #1 slot on the motherboard.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	Ground
5	Serial Out	10	NC

LAN (Ethernet) Ports

Two Ethernet Ports: (one Gbit LAN-JP3 and an Mb 10/100 LAN-JD3) are located beside the VGA port on the IO backplane. These ports accept RJ45 type cables. See Figure 2-3 for port definitions.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2(J28) keyboard and the PS/2 mouse are located on J9. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See Figure 2-3.)

PS/2 Keyboard and Mouse Port Pin Definitions (J9)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Fan Headers

Your motherboard has several fan headers designated CPU1 Chassis Fan, CPU2 Chassis Fan, Chassis Fan1, Chassis Fan2, Chassis Fan3 Chassis Fan4, and Chassis Fan5. The first two attach to the fans on the CPU heatsinks. See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: These fan headers are DC power.

Power LED/Speaker (JD1)

On the JD1 header, pins 1-3 are for the PWR LED and pins 4-7 are for the speaker connection. See the table on the right for speaker pin definitions. (Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.)

PW LED Pin Definitions (JD1)

Pin Number	Function	Definition
4	+	Red wire, Speaker data
5	Key	No connection
6		Key
7		Speaker data

Power Supply Fail Header

Connect a cable from your power supply to the JP8 header to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin on JF2 to indicate of a power failure on the chassis. See the table on the right for pin definitions.

Power Supply Fail Header Pin Definitions (JP8)

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

Note: This feature is only available when using redundant Supermicro power supplies.

Keylock

The keyboard lock connection is designated on JP35. Utilizing this header allows you to inhibit any actions made on the keyboard, effectively "locking" it.

Wake-On-LAN

The Wake-On-LAN header is designated WOL. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR1. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-on-Ring Pin Definitions (JWOR1)

Pin Number	Definition
1	Ground
2	Wake-up

Serial ATA Activity LED

The SATA Activity LED (JS5) is located next to SATA Ports (see MB layout). See the table on the right for pin definitions.

SATA Act_LED Pin Definitions (JS5)

Pin #	Definition	Pin #	Definition
1	SATA#0 Act	6	SATA#4 Act
2	SATA#1 Act	7	SATA#5 Act
3	SATA#2 Act	8	SATA#6 Act
4	SATA#3 Act	9	SATA#7 Act
5	Common	10	NC

2-6 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

Connector Pins

Jumper Cap

Setting

Pin 1-2 short
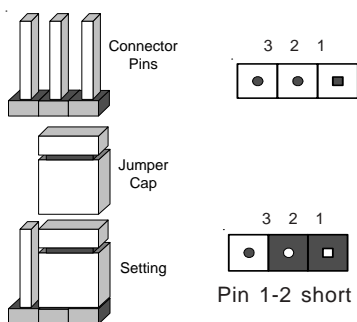
CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS. **Note:** For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS. *Do not use the PW_ON connector to clear CMOS.*

Mb LAN Enable/Disable

Change the setting of jumper JD3 to enable or disable the Mb LAN port on the motherboard (see Figure 2-3 for location). Refer to the table on the right for jumper settings. The default setting is Enabled.

Mb LAN Enable/Disable Jumper Settings (JD3)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Gb LAN Enable/Disable

Change the setting of jumper JP3 to enable or disable the Gb LAN port on the motherboard. (See Figure 2-3 for location). Refer to the table on the right for jumper settings. The default setting is Enabled.

Gb LAN Enable/Disable Jumper Settings (JP3)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

VGA Enable/Disable

JP4 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JP4)

Jumper Position	Definition
1-2	Enabled
2-3	Disabled

3rd Party Power Supply Alarm Enable/Disable (JP9) & Alarm Reset (JP36)

The system will notify you in the event of a power supply failure. This feature assumes that Supermicro redundant power supply units are installed in the chassis. If you only have a single power supply installed, you should disable this (the default setting) with JP9 to prevent false alarms. See the table on the right for jumper settings.

Power Supply Alarm Enable/Disable Jumper Settings (JP9)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

3rd Party PW Fail Alarm Reset Jumper Settings (JP36)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

Watch Dog Enable/Disable

Use JP37 to enable or disable the Watch Dog feature. The default position is open to disable the Watch Dog timer. The jumper must be used in conjunction with the Watch Dog enabled setting in BIOS (Advanced Setup > I/O Device Configuration). When enabled, Watch Dog can reboot your PC if an application is "hung up" or the system goes down. See the table on the right for jumper settings.

Watch Dog Timer Enable/ Disable Jumper Settings (JP37)

Jumper Position	Definition
Open	Disabled
Closed	Enabled

SATA Enable/Disable

The SATA Controller jumper located at JS1 allows you to enable or disable the onboard SATA Controller. See the table on the right for pin definitions.

SATA Enable/Disable Jumper Settings (JS1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Force-Power On (JP 40)

Instead of using the chassis power on switch, you may close Pins 1 & 2 of JP40 to apply power to the system. The default setting is open.

Force-PWR On (JP40)

Jumper Position	Definition
Off	Normal
On	Force-PWR On

2-7 Onboard Indicators

Gb/Mb LAN LEDs

The LAN (Ethernet) ports have two LEDs. On the Gb LAN port, the yellow (left) LED indicates activity while the other (right) LED may be green, orange or off to indicate the speed of the connection. See the tables at right for the functions associated with these LEDs.

Gb LAN Right LED Indicator(JLAN1)

LED Color	Definition
Off	No Connection
Green	100 MHz
Orange	1 GHz

Gb LAN Left LED Indicator(J1)

LED Color	Definition
Off	Not Active
Yellow	Active

2-8   Parallel Port, Floppy/Hard Disk Drive and SCSI Connections

Note the following when connecting the floppy and hard disk drive cables:
• The floppy disk drive cable has seven twisted wires.

• A red mark on a wire typically designates the location of pin 1.

• A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

Parallel Port Connector

The parallel (printer) port is located on J29. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions (J29)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

IDE Connectors

There are no jumpers to configure the onboard IDE#1(J2) and IDE#2 (J3) connectors. See the table on the right for pin definitions.

IDE Connector Pin Definitions (IDE#1, IDE#2)

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

Floppy Connector

The floppy connector is located on JP7. See the table below for pin definitions.

Floppy Connector Pin Definitions (JP7)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

Chapter 3
Troubleshooting

3-1   Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter.

Note: Always disconnect the power cord before adding, changing or installing any hardware components.

Before Power On

1. Make sure no short circuits exist between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install one CPU (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)

No Power

1. Make sure no short circuits exist between the motherboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

NOTE

If you are a system integrator, VAR or OEM, a POST diagnostics card is recommended. For I/O port 80h codes, refer to App. B.

Memory Errors

1. Make sure the DIMM modules are properly and fully installed.
2. Determine if different speeds of DIMMs have been installed and verify that the BIOS setup is configured for the fastest speed of RAM used. It is recommended to use the same RAM speed for all DIMMs in the system.
3. Make sure you are using registered ECC, PC1600 (DDR-200) or PC2100 (DDR-266) SDRAM. EDO SDRAM and PC100/133 SDRAM are not supported. (Note: PC2100 is supported but runs at 200 MHz only if FSB 400MHz CPUs are used.)
4. Check for bad DIMM modules or slots by swapping a single module between two slots and noting the results.
5. Make sure all memory modules are fully seated in their slots. As an interleaved memory scheme is used, you must install two modules at a time, beginning with Bank 1, then Bank 2, then Bank 3 (see Section 2-3).
6. Check the power supply voltage 115V/230V switch.

Losing the System's Setup Configuration

1. Ensure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2   Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a motherboard manufacturer, SuperMicro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

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1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our web site (http://www.supermicro.com/techsupport.htm) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our web site at http://www.supermicro.com/techsupport/download.htm.

Note: Not all BIOS can be flashed depending on the modifications to the boot block code.

3. If you still cannot resolve the problem, include the following information when contacting Super Micro for technical support:
   •Motherboard model and PCB revision number
   •BIOS release date/version (this can be seen on the initial display when your system first boots up)
   •System configuration
   An example of a Technical Support form is on our web site at http://www.supermicro.com/techsupport/contact_support.htm.

4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com or by fax at: (408) 503-8000, option 2.

3-3 Frequently Asked Questions

Question: What are the various types of memory that the X5DPL-TGM motherboard can support?

Answer: The X5DPL-TGM has six DIMM slots that support 184-pin, registered ECC DDR-266/200 (PC2100/1600) SDRAM modules (DDR-266 is only supported at 200 MHz when used with 400 MHz FSB processors). It is strongly recommended that you do not mix memory modules of different speeds and sizes. Unbuffered SDRAM, non-ECC memory and PC100/133 SDRAM modules are not supported.

Question: How do I update my BIOS?

Answer: It is recommended that you **do not** upgrade your BIOS if you are experiencing no problems with your system. Updated BIOS files are located on our web site at http://www.supermicro.com. Please check our BIOS warning message and the info on how to update your BIOS on our web

site. Also, check the current BIOS revision and make sure it is newer than your BIOS before downloading. Select your motherboard model and download the BIOS file to your computer. Unzip the BIOS update file and you will find the readme.txt (flash instructions), the phlash.bat (BIOS flash utility), the platform.bin (platform file) and the BIOS image (xxxxxx.rom) files. Copy these files onto a bootable floppy and reboot your system. It is not necessary to set BIOS boot block protection jumpers on the motherboard. At the DOS prompt, enter the command "phlash." This will start the flash utility and give you an opportunity to save your current BIOS image. Flash the boot block and enter the name of the update BIOS image file.

Question: After flashing the BIOS my system does not have video. How can I correct this?

Answer: If the system does not have video after flashing your new BIOS, it indicates that the flashing procedure failed. To remedy this, first clear CMOS per the instructions in this manual and retry the BIOS flashing procedure. If you still do not have video, please use the following **BIOS Recovery Procedure**. Boot up the system from a Win98 boot disk. Type A:\>phlash /s /cz /mfg /mode=3 [BIOS filename.rom], making sure you insert the spaces. The system will flash BIOS from here and reboot once it finishes.

To recover BIOS: a recovery flash requires an update key over the COM port as follows: hardwire Pin4 to Pin8, hardwire Pin9 and Pin7 to Pin6, and hardwire Pin3 to Pin2. Use the Supermicro CD to make a "Phoenix BIOS Crisis Disk for Supermicro Mainboard". This disk includes a BIOS file named "bios.rom". Please note, this BIOS file can be changed to a different Phoenix BIOS file as long as it's named "bios.rom". Connect the serial key to the COM port, insert the recovery disk into floppy drive and power on the system. When the system starts to read the disk, remove the serial key immediately. When the system is done with the BIOS recovery, it will automatically reboot.

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for Windows and security and audio drivers.

Question: Why can't I turn off the power using the momentary power on/off switch?

Answer: The instant power off function is controlled in BIOS by the Power Button Mode setting. When the On/Off feature is enabled, the motherboard

will have instant off capabilities as long as the BIOS has control of the system. When the Standby or Suspend feature is enabled or when the BIOS is not in control such as during memory count (the first screen that appears when the system is turned on), the momentary on/off switch must be held for more than four seconds to shut down the system. This feature is required to implement the ACPI features on the motherboard.

3-4   Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Notes

Chapter 4
BIOS

4-1   Introduction

This chapter describes the PhoenixBIOS™ Setup utility for the X5DPL-TGM. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to BIOS that may not be reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The PhoenixBIOS flash chip stores the system parameters, such type of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a back-up battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the computer is powered-on the computer is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot-up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot, see below.

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 4-3, detailed descriptions are given for each parameter setting in the Setup utility.

4-2   Running Setup

Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see on next page).

When you first power on the computer, the PhoenixBIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1.   By pressing <Delete> immediately after turning the system on, or
2.   When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

4-3   Main BIOS Setup

All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use sub-menus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu

```
                        Phoenix BIOS Setup Utility

    Main      Advanced      Security      Power      Boot      Exit

                                                  Item Specific Help

    System Time                    [16:19:20]
    System Date                    [02/02/02]

    Legacy Diskette A:             [1.44/1.25 MB]
    Legacy Diskette B:             [Not Installed]

    ▶ Primary Master               [120 GB]
    ▶ Primary Slave                [None]
    ▶ Secondary Master             [CD-ROM]
    ▶ Secondary Slave              [None]


    System Memory                  256 MB
    Extended Memory                3967 KB



    F1 Help     ↑↓ Select Item    -/+  Change Values    F9 Setup Defaults
    Esc Exit    ↔  Select Menu    Enter Select ▶ Sub-Menu  F10 Save and Exit
```

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields and enter the correct data. Press the <Enter> key to save the data.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Legacy Diskette B

This setting allows the user to set the type of floppy disk drive installed as diskette B. The options are **Disabled**, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, 1.44/1.25MB, 3.5 in and 2.88MB 3.5 in.

▶Primary Master/Primary Slave/Secondary Master/Secondary Slave

These settings allow the user to set the parameters of the IDE Primary Master/Slave and IDE Secondary Master/Slave slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

```
                        Phoenix BIOS Setup Utility
 ┌────────────────────────────────────────────────────────────────────────┐
 │ Main     Advanced     Security     Power      Boot       Exit           │
 ├──────────────────────────────────────────────┬─────────────────────────┤
 │                                               │ Item Specific Help      │
 │  Type:                  [Auto]                │                         │
 │                                               │ Select the drive        │
 │                                               │ type of the fixed       │
 │  Multi Sector Transfer; [16 Sectors]          │ disk installed in       │
 │  LBA Mode Control:      [Enabled]             │ your system. If type    │
 │  32-bit I/O:            [Enabled]             │ User is selected,       │
 │  Transfer Mode:         [Fast PIO 4]          │ Cylinders, Heads,       │
 │  Ultra DMA Mode         [Disabled]            │ and Sectors can be      │
 │  SMART Monitoring       [Disabled]            │ edited directly.        │
 │                                               │ Auto attempts to        │
 │                                               │ automatically detect    │
 │                                               │ the drive type for      │
 │                                               │ drives that comply      │
 │                                               │ with ANSI               │
 │                                               │ specifications.         │
 │                                               │                         │
 ├──────────────────────────────────────────────┴─────────────────────────┤
 │ F1 Help    ↑↓  Select Item    -/+  Change Values    F9 Setup Defaults   │
 │ Esc Exit   ↔   Select Menu    Enter Select▶Sub-Menu  F10 Save and Exit  │
 └────────────────────────────────────────────────────────────────────────┘
```

Type

Selects the type of IDE hard drive. The options are **Auto** (allows BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CD-ROM and ATAPI Removable.

Multi-Sector Transfers

Select the number of transfer sectors. Options are 2, 4, 6, 8 and **16 Sectors**.

LBA Mode Control

This item determines whether Phoenix BIOS will access the IDE Primary Master Device via LBA mode. The options are **Enabled** and Disabled.

32-bit I/O

Selects 32-bit I/O operation. Options are Enabled and **Disabled**.

Transfer Mode

Selects the transfer mode. Options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, **Fast PIO4**, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

Selects Ultra DMA Mode. Options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4 and Mode 5.

SMART Monitoring

The feature allows you to enable or disable the function of SMART Monitoring. Options are Enabled and **Disabled**.

System Memory

This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

4-4   Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow
keys. You should see the following display. The items with a triangle beside
them have sub menus that can be accessed by highlighting the item and pressing
<Enter>. Options for PIR settings are displayed by highlighting the setting option
using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options
are described in this section.

```
┌─────────────────────────────────────────────────────────────────────┐
│                    Phoenix  BIOS  Setup  Utility                      │
├─────────────────────────────────────────────────────────────────────┤
│  Main        Advanced        Security          Boot      Exit         │
├─────────────────────────────────────────────────────────────────────┤
│     Quick Boot Mode            [Enabled]       Item Specific Help      │
│     Quiet Boot                 [Enabled]                               │
│  ▶  PCI/PnP Configuration                                             │
│  ▶  I/O Device Configuration                                          │
│  ▶  Advanced Chipset Control                                          │
│  ▶  Advanced Processor Options                                        │
│  ▶  DMI Event Logging                                                 │
│  ▶  Console Redirection                                               │
│  ▶  Summary Screen             [Enabled]                              │
│                                                                       │
│                                                                       │
│                                                                       │
├─────────────────────────────────────────────────────────────────────┤
│   F1 Help    ↑↓ Select Item   −/+  Change Values      F9 Setup Defaults│
│   Esc Exit   ↔  Select Menu        Enter Select ▶Submenu  F10 Save and Exit│
└─────────────────────────────────────────────────────────────────────┘
```

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine
after the computer is turned on. The settings are **Enabled** and Disabled. If
Disabled, the POST routine will run at normal speed.

Quiet Boot

This setting allows you to **Enable** or Disable the diagnostic screen during
boot-up.

▶**PCI/PnP Configuration**

Access the submenu for this item to make changes to the PCI/PnP configuration, as listed below.

Onboard LAN1 OPROM Configure

Enabling this setting allows you to boot your system from LAN 1. Options are Enabled and **Disabled**.

Onboard LAN2 OPROM Configure

Enabling this setting allows you to boot your system from LAN 2. Options are Enabled and **Disabled**.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are Enabled and **Disabled**.

Installed OS

This setting allows you to select the operating system for your computer. The settings are Other, Win95, Win98, WinMe and **Win 2000**.

NT4 Installation Workaround

This setting allows BIOS to provide a workaround for the absence of a floppy drive during NT4 installation. Options are Enabled and **Disabled**.

Reset Configuration Data

Options are Yes and **No**. Choosing Yes will clear the Extended System Configuration Data (ECSD).

▶**PCI Slot Configuration**

PCI/PCIX Frequency (Slot 4-5)

This setting controls the bus speed of PCI-X slots # 4 and 5. Options are PCI 33 MHz, PCI 66 MHz, PCI-X 100 MHz, PCI-X 133 MHz and **Auto**.

PCI/PCIX Frequency (Slot 6)

This setting controls the bus speed of PCI-X slots # 4 and 5. Options are PCI 33 MHz, PCI 66 MHz, PCI-X 100 MHz, PCI-X 133 MHz and **Auto**.

▶**PCI Device, Slot 1**

▶**PCI Device, Slot 2**

▶**PCI Device, Slot 3**

▶**PCI Device, Slot 4**

▶**PCI Device, Slot 5**

▶**PCI Device, Slot 6**

Option ROM Scan

This setting (included in the submenu for the above six settings) will initialize the selected device's expansion ROM when enabled. Options are **Enabled** and Disabled.

Enabled Master

This setting (included in the submenu for the above six settings) will designate the selected device as the PCI bus master when enabled. Options are Enabled and **Disabled**.

Latency Timer

This setting (included in the submenu for the above six settings) sets the minimum guaranteed time allotted to the bus master in units of PCI bus clocks. Options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h and 00E0h.

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

Local Bus IDE Adapte
Use this setting to enable the integrated local bus IDE adapter.
Options are Disable, Primary, Secondary and **Both**.

▶Cache Memory

Cache System BIOS Area

Use this feature to control the System BIOS Area to be cached. Options are Uncached and **Write Protect**.

Cache Video BIOS Area

Use this feature to control the Video BIOS Area to be cached. Options are Uncached and **Write Protect**.

Cache Base 0-512K

Use this feature to control the 512K base memory area to be cached. Options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Base 512K-640K

Use this feature to control the 512K-640K base memory area to be cached. Options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Extended Memory Area

Use this setting to control the extended memory area to be cached. Options are Uncached, Write Through, Write Protect, and **Write Back**.

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

Power Loss Control
This setting allows you to choose how the system will react when power returns after an unexpected loss of power. Options are Stay Off, Power On and **Last State**.

Watch Dog

This setting is used to enable or disabled the Watch Dog Timer function. It must be used in conjunction with the JP37 jumper (see Chapter 2 for details). Options are Enabled and **Disabled**.

KBC Clock Input

Use this setting to select the keyboard clock rate. Options are 6 MHz, 8 MHz and **12 MHz**.

Serial Port A

This setting allows you to assign control of serial port A. The options are **Enabled** (user defined), Disabled, and Auto (BIOS controlled or OS Controlled.)

Base I/O Address

Select the base I/O address for serial port A. The options are **3F8**, 2F8, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port A. Options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to assign control of serial port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled or OS Controlled).

Mode

Specify the type of device that will be connected to serial port B. Options are **Normal** and IR (for an infrared device).

Base I/O Address

Select the base I/O address for serial port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port B. Options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS or OS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

Select the IRQ (interrupt request) for the parallel port. Options are IRQ5 and **IRQ7**.

Mode

Specify the parallel port mode. Options are Output Only, Bi-directional, EPP and **ECP**.

DMA Channel

Specify the DMA channel. Options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled and Auto (BIOS or OS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **Primary** and Secondary.

▶**Advanced Chipset Control**

Access the submenu to make changes to the following settings.

Clock Spectrum Feature

Clock Spectrum is a technique used to stabilize a system by reducing the level of Electromagnetic Interference. The options are Enabled and **Disabled**.

S.M.A.R.T Monitoring

This setting lets you enable or disable the function of IDE Failure Prediction. The options are **Enabled** and Disabled.

ECC Config(ure)

This setting allows the user to configure the system memory to ECC if ECC is supported by all memory modules. The options are: Disabled, and **ECC**.

ECC Error Type

When an ECC Error occurs, BIOS will generate an interrupt. This option allows the user to select the type of interrupt to report. The options are: **None**, NMI (Non-Masked Interrupt), SMI (System Management Interrupt) and SCI (System Control Interrupt).

SERR Signal Condition

This setting allows the user to determine the type of ECC Errors to be detected and reported. When this particular type of ECC Error occurs, an SERR# signal will be generated to report the error. The options are: **None**, Single bit, Multiple bits, and Both.

▶Advanced Processor Options

Access the sub-menu to make changes to the following settings.

CPU Speed

This displays the speed of the installed processor.

Fast String Operations

This setting allows you to **Enable** or Disable fast string operations.

Compatible FPU Code

This setting allows you to Enable or **Disable** the compatible FPU code.

Split Lock Operations

This setting allows you to **Enable** or Disable split lock operations.

Hyper-Threading

This setting allows you to **Enable** or Disable hyper-threading. Enabling hyper-threading results in increased CPU performance.

▶DMI Event Logging

Access the sub-menu to make changes to the following settings.

Event Log Validity

This is a display, not a setting, informing you of the event log validity.

Event Log Capacity

This is a display, not a setting, informing you of the event log capacity.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the DMI event log.

Event Logging

This setting allows you to **Enable** or Disable DMI event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

This setting will clear all DMI event logs when set to Yes. Options are Yes and **No**.

▶**Console Redirection**

Access the submenu to make changes to the following settings.

COM Port Address

Specifies to redirect the console to On-board COMA or On-board COMB. This setting can also be **Disabled**.

BAUD Rate

Select the BAUD rate for console redirection. The options are: 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

Console Type

Choose from the available options to select the console type for console redirection. The settings are VT100, VT100, 8bit, PC ANSI, 7 bit, **PC ANSI**, VT100+, VT-UTF8.

Flow Control

Choose from the available options to select the flow control for console redirection. The settings are None, X0N/XOFF, **CTS/RTS**.

Console Connection

Select the console connection: either Direct or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the OS has been loaded. Options are On and **Off**.

of Video Pages to support

Choose the number pf video pages to allocate for redirection when video hardware is not available. Options are **1**, 2, 3, 4, 5, 6, 7, and 8.

Summary Screen

Enable this function to display system configuration during boot. Options are Disabled and **Enabled**.

4-5   Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.

```
                                      Phoenix BIOS Setup Utility

 Main      Advanced    Security     Power     Boot     PIR      Exit

                                                       Item Specific Help
 Supervisor Password Is:          [Clear]
 User Password Is:                [Clear]

 Set Supervisor Password:         [Enter]
 Set User Password:               [Enter]

 Password on Boot                 [Disabled]
 Fixed Disk Boot Sector           [Normal]










 F1 Help      ↑↓  Select Item    -/+  Change Values    F9 Setup Defaults
 Esc Exit     ↔   Select Menu    Enter Select ▶Sub-Menu  F10 Save and Exit

```

Supervisor Password Is

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Password on Boot

This setting allows you to require a password to be entered when the system boots up. Options are Enabled (password required) and Disabled (password not required).

Fixed Disk Boot Sector

This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

4-6 Power

Choose Power from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Power setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Power BIOS settings are described in this section.

```
                              Phoenix BIOS Setup Utility

Main     Advanced    Security    Power    Boot    PIR    Exit

                                                 Item Specific Help
ACPI Mode:                    [Yes]
Power Savings:                [Customized]

Suspend Timeout:              [Off]
Resume on Time:               [Off]
Resume Time:                  [00:00:00]
 Resume On Modem Ring          [Off]




F1 Help      ↑↓  Select Item    -/+  Change Values    F9 Setup Defaults
Esc Exit     ↔   Select Menu    Enter Select▶Sub-Menu  F10 Save and Exit
```

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. Options are **Yes** and No.

Power Savings

This setting sets the degree of power saving for the system. The options are Disabled, **Customized**, Maximum Power Savings and Maximum Performance. Customized allows you to alter the other two modes.

Suspend Timeout

Use this setting to specify the period of system inactivity to transpire before entering the suspend state. Options are **Off**, 5 min, 10 min, 15 min, 20 min, 30 min, 40 min and 60 min.

Resume on Time

Select either **Off** or On, which will wake the system up at the time specified in the next setting.

Resume Time

Use this setting to specify the time you want the system to wake up (the above setting must be set to (On). Enter the time with the number keys.

Resume On Modem Ring

If set to On, this function wakes the system up when an incoming call is detected on your Modem. The options are On and **Off**.

4-7   Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or - will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

```
┌─────────────────────────────────────────────────────────────────────────┐
│                      Phoenix BIOS Setup Utility                           │
├─────────────────────────────────────────────────────────────────────────┤
│  Main     Advanced    Security    Power    [Boot]    PIR     Exit         │
│                                                                           │
│                                                    Item Specific Help     │
│  + Removable Devices                                                      │
│  CD-ROM Drive                                                             │
│  + Hard Drive                                                             │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
│                                                                           │
├─────────────────────────────────────────────────────────────────────────┤
│  F1 Help     ↑↓  Select Item    -/+  Change Values    F9 Setup Defaults   │
│  Esc Exit    ↔   Select Menu    Enter Select ▶ Sub-Menu  F10 Save and Exit│
└─────────────────────────────────────────────────────────────────────────┘
```

+Removable Devices

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of removable devices in the Item Specific Help window.

Legacy Floppy Drive

See details on how to change the order and specs of removable devices in the Item Specific Help window.

CD-ROM Drive

See details on how to change the order and specs of removable devices in the Item Specific Help window.

+Hard Drive

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.

4-8   PIR

Choose PIR from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. PIR stands for "Processor Info ROM", which allows BIOS to read certain information from the processors. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All PIR BIOS Setup options are described in this section.

```
┌──────────────────────────────────────────────────────────────────────┐
│                                    Phoenix BIOS Setup Utility          │
├──────────────────────────────────────────────────────────────────────┤
│ Main     Advanced    Security    Power     Boot     PIR      Exit      │
├───────────────────────────────────────────────┬──────────────────────┤
│                                                │  Item Specific Help   │
│  Select the Processor's PIR                    │                       │
│  Select the Thermal Unit                       │                       │
│  ▶  Processor Info ROM Data                     │                       │
│  ▶  Hardware Monitor Logic                      │                       │
│                                                │                       │
│                                                │                       │
│                                                │                       │
│                                                │                       │
│                                                │                       │
│                                                │                       │
│                                                │                       │
├───────────────────────────────────────────────┴──────────────────────┤
│ F1 Help      ↑↓  Select Item    -/+  Change Values    F9 Setup Defaults │
│ Esc Exit     ↔   Select Menu    Enter Select ▶Sub-Menu  F10 Save and Exit│
└──────────────────────────────────────────────────────────────────────┘
```

Select the Processor's PIR

This feature allows you to select the Processor's PIR. If the value is changed, then you must update NVRAM by saving the changes before you will actually see the new PIR information. Options are **A0h/A1h**, A2h/A3h, A4h/A5h, A6h/A7h, A8h/A9h, AAh/ABh, ACh/ADh and AEh/AFh. See the Item Specific Help field for details.

Select the Thermal Unit

This feature allows you to selects which processor's Thermal Unit to display. If the value is changed, then you must update NVRAM by saving the changes before you will actually see the new PIR information. Options are **30h/31h**, 32h/33h, 34h/35h, 52h/53h, 54h/55h, 56h/57h, 98h/99h, 9Ah/9Bh and 9Ch/9Dh. See the Item Specific Help field for details.

▶**Processor Info ROM Data**

Highlight this and hit <Enter> to see PIR data on the following items:

Header Info

Processor Data

Processor Core Data

L3 Cache Data

Package Data

Part Number Data

Thermal Reference Data

Feature Data

Other Data

OEM Data

▶**Hardware Monitor Logic**

Highlight this and hit <Enter> to display monitor data for the following items:

Overheat Temperature Trip [72^0 C, **78^0 C**, 85^0 C]

CPU1 Temperature (^{0} C)

CPU2 Temperature (^{0} C)

System Temperature (^{0} C)

CPU Fan1 Chassis Fan

CPU Fan2 Chassis Fan

Chassis Fan3

Processor Vcore (V)

3.3V Standby (V)

3.3V Vcc (V)

12V Vcc (V)

1.8V Vcc (V)

-12V Vcc (V)

4-9   Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys.
You should see the following display. All Exit BIOS settings are described in this
section.

```
                                         Phoenix BIOS Setup Utility

 Main      Advanced    Security    Power    Boot    PIR    Exit

                                                  Item Specific Help
 Exit Saving Changes
 Exit Discarding Changes
 Load Setup Defaults
 Discard Changes
 Save Changes




 F1 Help       ↑↓  Select Item    -/+  Change Values     F9 Setup Defaults
 Esc Exit      ↔   Select Menu    Enter Select ▶Sub-Menu  F10 Save and Exit
```

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Notes

Appendix A
BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key
Stuck key on keyboard.

Keyboard error
Keyboard not working.

Keyboard Controller Failed
Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch
Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP
Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn Extended memory not working or not configured properly at offset **nnnn.**

System battery is dead - Replace and run SETUP
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used
System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error
The timer test failed. Requires repair of system board.

Real time clock error
Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings
BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used
Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS
Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error
Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP
Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP
Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:
CPU socket number for Multi-Processor error.

EISA CMOS not writeable
ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed
ServerBIOS2 test error: Fail-Safe Timer takes too long.

device Address Conflict
Address conflict for specified **device.**

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

Failing Bits: nnnn
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n
Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully
tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup
and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and
display it on the screen. If it cannot locate the address, it displays **????.** Parity is
a method for checking errors in binary data. A parity error indicates that some
data has been corrupted.

Parity Check 2 nnnn

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*

Displays the address *nnnn* of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Notes

Appendix B
BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

> 1 long and two short beeps - video configuration error
> 1 continuous long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen.

The following is a list of codes that may be written to port 80h.

POST Code	Description
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Initialize PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line *xxxx**
2Eh	1-3-4-3 RAM failure on data bits *xxxx** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
47h	Initialize I20 support
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt "Press F2 to enter SETUP"
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
6Eh	Display possible high address for UMB recovery
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ah	Shadow option ROMs
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase F2 prompt
AAh	Scan for F2 key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS
B9h	Prepare Boot
BAh	Initialize SMBIOS
BBh	Initialize PnP Option ROMs
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error handler
C5h	PnPnd dual CMOS (optional)
C6h	Initialize note dock (optional)
C7h	Initialize note dock late
C8h	Force check (optional)
C9h	Extended checksum (optional)
CAh	Redirect Int 15h to enable remote keyboard
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk
CCh	Redirect Int 10h to enable remote serial video

POST Code	Description
CDh	Re-map I/O and memory for PCMCIA
CEh	Initialize digitizer and display message
D2h	Unknown interrupt

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (***xxxx***) indicating the address line or bits that failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix C

Installing Software Programs and Drivers

(*Note: if you do not wish to configure onboard SATA RAID functions, please go directly to Section C-6 on Page C-20 for Operating System & Other Software Installation.)

After all the hardware has been installed, you must first configure Adaptec's Serial ATA RAID Driver (*Note) before you install the Windows operating system, and other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

C-1 Configuring Serial ATA RAID Functions

Serial ATA (SATA)
Serial ATA(SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates up to 150MBps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Introduction to Adaptec's Serial ATA RAID Controller
Adaptec Embedded Serial ATA RAID with HostRAID adds RAID functionality to the SATA I/O controller by supporting RAID levels 0, 1, and 10. With HostRAID, you can optimize the reliability, performance and data protection of the system.

Adaptec's Serial ATA RAID Storage Requirements
Adaptec's device drivers and storage management software require approximately 20 MB of disk space.

Operating Systems supported by the SATA RAID Host Controller

Microsoft
*Windows® 2000, Windows Server® 2003, and Windows XP

Linux
*Red Hat 8.0 and 9.0
*SuSE 8.1 and 8.2

Storage Management Software Overview

Adaptec Embedded Serial ATA RAID includes the following software tools to manage your storage subsystem:

Adaptec Storage Manager – Browser Edition—Browser-based storage management software that provides all of the creation, management, and data logging needed to manage arrays. Arrays may be set up and managed on systems using the following operating systems: Windows 2000, Windows Server 2003, and Windows XP

Red Hat Linux 8.0 and 9.0-SuSE Linux 8.1 and 8.2.

Adaptec RAID Configuration (ARC) Utility—Part of the controller's built-in BIOS code. You start ARC by pressing Ctrl+A during BIOS startup.

Array Configuration Utility (ACU)—A DOS/BIOS application used to create, configure, and manage arrays.

C-2 Adaptec's SATA RAID Host Driver Installation

Installing the Driver in a New Windows System

To install the driver to a new system that does not have the OS installed:

1. Create a driver disk by following the instructions from the Web site or the product CD.

2. Restart the computer.

3. If creating an array, press Ctrl-A when prompted to enter the ARC utility. For instructions on creating an array from the BIOS, see Adaptec RAID Configuration Utility. For a simple volume, skip to Step 4.

4. When the array is finished building or if you are continuing from Step3, insert the Windows setup CD and restart the system.

5. Press F6 when prompted to install a third-party driver.

(*Note: When F6 is active, a prompt appears at the bottom of the screen. Press F6 immediately—you only have 5 seconds. If you miss your chance, restart this Windows installation to complete it correctly. Otherwise, Windows will not recognize your controller.)

6. Insert the driver disk you created in Step 1 and wait until prompted to install a driver.

7. Press S to specify that the driver is on the floppy disk, and press Enter. Windows searches the disk for a suitable driver.

8. When the Adaptec Embedded Serial ATA HostRAID driver is found, press Enter. Follow the remaining on-screen instructions to complete your installation.

Installing the Driver in an Existing Windows System

Please follow the steps listed below to install a driver in a system that already has a Windows operating system:

1. Create a driver disk by following the instructions from the Web site or the product CD.

2. Start Windows. Windows launches the Found New Hardware Wizard, which searches for the controller driver.

3. Insert the driver disk you created in Step 1. Select the floppy disk drive as the source and click Next.

4. If necessary, select the appropriate driver for your operating system.

5. Click Next as needed to complete the controller installation.

6. Remove the driver disk.

7. If prompted, restart the computer.

8. Your installation is complete. If you want to create an array from the BIOS, see the section-"Adaptec RAID Configuration Utility". If you want to create an array from the operating system, see the section-"Using Adaptec Storage Manager – Browser Edition".

Installing the driver in a new Linux system

To Install the Red Hat 8.0 or 9.0 Driver in a New Linux System:

1. Obtain a driver disk from either the Web site or the product CD.

2. Restart the computer.

3. If creating an array, press Ctrl-A when prompted to enter the ARC utility. For instructions on creating an array from the BIOS, see the section-"Adaptec RAID Configuration Utility". For a simple volume, skip to Step 4.

4. When the array is finished building, or if you are continuing from Step 3, insert the Red Hat CD Disk 1 in the CD-ROM drive and restart the system.

5. When the Red Hat Welcome screen appears, type expert or linux dd at the boot prompt.

6. When prompted, insert the driver disk (see Step 1) and select OK.

7. Follow the prompts to set up your preferred environment.

8. If you intend to install other third-party devices, proceed with the installation of those devices. Otherwise, select Done.

9. Continue with the Linux installation according to the Red Hat documentation.

Installing the SuSE 8.1 or 8.2 Driver in a New Linux System

1. Obtain a driver disk from either the Web site or the product CD.

2. Restart the computer.

3. If creating an array, press Ctrl-A when prompted to enter the ARC utility. For instructions on creating an array from the BIOS, see the section- "Adaptec RAID Configuration Utility". For a simple volume, skip to Step 4.

4. When the array is finished building, or if you are continuing from Step3, insert the SuSE CD Disk 1 in the CD-ROM drive and restart the system.

5. When the SuSE Installation menu appears:

* For SuSE 8.1—press the Alt key, then select installation option from the Menu and press Enter.

* For SuSE 8.2—press the F3 key, then select installation option from the Menu and press Enter.

6. When prompted, insert the driver disk you created (see Step 1) and press any key to continue.

7. Follow the prompts to set up your preferred environment.

8. Continue with the Linux installation according to the SuSE documentation.

9. After reboot occurs the SuSE Menu appears:

* For SuSE 8.1—type noapic at the boot options, then press

Enter.

* For SuSE 8.2—type acpi=off at the boot options, then press Enter.

(*Note: See Step 10 to include these parameters automatically during bootup.)

10. When the Linux installation is complete, go to the script file by typing:

* For SuSE 8.1 edit/boot/grub/menu.lst

Type noapic after vga=xxx as in this example:

Kernel(hd0,0)/vmlinux root=/dev/hdc3 vga=791 noapic

* For SuSE 8.2 edit/boot/grub/menu.lst

Type acpi=off after vga=xxx as in this example:

Kernel(hd0,0)/vmlinux root=/dev/hdc3 vga=791 acpi=off

Installing or Updating the Driver in an Existing Red Hat or SuSE Linux System

* To install the driver in an existing Red Hat or SuSE Linux system, type: rpm -Uvh xxx.yyy.rpm

*To update the driver in an existing Linux system, type:

rpm -Uvh —force xxx.yyy.rpm

where xxx is the name of the driver file and yyy is the processor

type.

C-3 Installing Adaptec Storage Management

A. Browser Edition
Overview

This chapter discusses the installation procedure for installing Adaptec Storage Manager – Browser Edition to enable remote and local management of arrays.

Browsers supported:

To run Adaptec Storage Manager – Browser Edition, your computer must have a Web browser supporting JavaScript and cookies only. The following versions are supported:

Windows

* Internet Explorer (IE) 5.0 or later

* Netscape 7 or later

Linux

* Adaptec-supplied and installed version of Mozilla

*Netscape 7 or later

When using Adaptec Storage Manager, you need to log on to your system with administrator privileges.

Typical, Custom, and Compact Installations

You can select from these setup options:

<u>* Typical (default)</u>—Supports local and remote management; however, Adaptec SNMP is not included.

<u>* Custom</u>—For expert users. Primarily used on Web servers or when you want to make sure SNMP and Notifier are available for a managed system.

You can select from these components:

* Managed System Components—If you choose this selection only, the installation is the same as a Compact installation.

* Adaptec Web Server—Installs components allowing managed systems to communicate with Web browsers.

* Adaptec Storage Manager Notifier—Installs messaging, including email and broadcaster capabilities.

* Adaptec SNMP—Installs components used by SNMP-based applications. Requires Microsoft SNMP agents to be installed to function. Not included in a Typical installation.

*Compact—Installs only the components required on a remotely managed system. See Managed System Components, above.

(*Note: When you perform a Typical or Compact installation, components needed for communication and remote management are installed automatically.*)

B. On Windows

**Note: When installing on a FAT 32 file system, the folder being installed is automatically hidden.)

To install Adaptec Storage Manager – Browser Edition

1. Verify that a supported browser is installed. See the section-"Supported Browsers" for details.

2. Insert the product installation CD and wait for the Autorun executable to start the installation. If this does not occur, browse the CD and click Autorun.

3. Click Adaptec Utilities.

4. Click Install Adaptec Storage Manager.

5. Click Next in the Install Shield window.

6. Read the license agreement. If you agree to its terms, click Yes. If not, click No and terminate the installation.

The Select a Setup Type window appears. It provides three types of installations: Typical, Compact, and Custom. See the sections regarding: "Typical, Custom, and Compact Installations" for details.

7. Choose a setup type and click Next.

8. When you see the Destination Folder, click Next.

9. When you see the Setup Information, click Next.

The Setup Status window shows progress using a scroll bar. Before the scroll bar shows the installation is completed, another window pops up indicating that a security certificate has been generated.

10. Click OK.

The Root Certificate Store window appears.

11. Click Yes.

The security certificate generated during installation is added to the Certificate Store. If you click No at this point, you will need to install the certificate the first time you run Adaptec Storage Manager.

12. When prompted to restart your computer, accept the default (Yes) and click Finish.

13. The system restarts to complete the installation.

14. Remove the product installation CD before the system restarts; otherwise, the installation will start again.

Configuring Internet Browsers on Windows

If you are managing a local storage array and your computer uses a proxy server, you need to configure your browser to enable Adaptec Storage Manager to bypass the proxy server. Also, if you are managing remote systems, you need to configure Adaptec Storage Manager to bypass the proxy server when communicating with these systems.

Configuring Internet Explorer for Local Management

When using the High security setting, you must enable the following settings manually:

* JavaScript

* Cookies (not stored)

You do not need to enable the following custom level security settings for the local Intranet in Internet Explorer 5 and 5.5. Select Tools > Internet Options to access these settings:

*   Active Scripting

*   Allow per session cookies (not stored)

(*Note: In Internet Explorer 6.0 there is no security setting for cookies. Cookie configuration was removed from the Privacy tab. There is no setting for blocking Intranet cookies.)

If you are using a proxy server to access the Internet, you must bypass the proxy server to access the Adaptec Storage Manager Web server. To verify whether you are using a proxy server:

1. From the Internet Option window, click the Connections tab.

2. Click LAN Settings.

* If the Use a proxy server box isn't checked, exit by clicking OK. You aren't using a proxy server, so ignore this setting.

* If the Use a proxy server box is checked, make sure the Bypass proxy server for local addresses box is also checked. Then, click the Advanced button. In the Exceptions window, enter localhost as an entry.You are now ready to proceed to the section-"Using Adaptec Storage Manager – Browser Edition".

Configuring Internet Explorer for Remote Management

If you know the IP address of the system you want to manage remotely:

1. Choose Tools > Internet Options > Connections > LAN Settings.

2. Select Use a proxy server for your LAN > Advanced.

3. In the Exceptions section, type the managed system's IP address.

Configuring Netscape Navigator for Local Management

(*Note: These instructions apply specifically to version 7 and may differ in later versions.)

To configure Netscape Navigator:

1. Log in to your computer with administrator access.

2. Select Edit > Preferences.

3. In the Preferences window, click the right arrow on the Privacy and Security line. Ensure that one of the Enable cookies options is selected.

4. Select the Advanced line. Ensure that Enable Javascript for Navigator is checked.

5. Exit Navigator, then restart it. This enables any settings you have modified.

6. You are now ready to proceed to C-4-"Using Adaptec Storage Manager – Browser Edition".

Configuring Netscape Navigator for Remote Management

If you know the IP address of the system you want to manage remotely:

1. Choose Edit> Preferences > Advanced> Proxies > Manual proxy configuration > No Proxy For.

2. Type the managed system's IP address.

To install Adaptec Storage Manager on Linux

(*Note: When performing this installation, keep in mind that Linux is case sensitive.)

To install Adaptec Storage Manager on a Linux computer and configure the desired Internet browser:

1. Insert the product installation CD.

2. Install the software by typing: sh <mount-point>/install.sh.

The <mount-point> differs among computers, but /mnt/cdrom, /media/cdrom, or cdrom usually works. A Welcome window appears.

3. Click Next. The License Agreement window appears.

4. Read the license agreement. If you agree to its terms, click Accept. If not, click Cancel and terminate the installation.

The Choose Setup Type window appears. It provides three types of installations: Typical, Compact, and Custom. See the section-"Typical, Custom, and Compact Installations" for details.

5. Choose a setup type and click Next. The Start Copying window appears.

6. Click Next. The Running Non-Interactive Setup window displays the files being loaded onto the system.

7. Click Next when prompted. A Setup Complete window appears.

8. Click Complete. A message window appears reminding you that any proxy servers must be bypassed for the RAID management application to work.

9. Click OK. The Shell window you used to launch the installation indicates that some daemons are being started.

The installation creates a shortcut to Adaptec Storage Manager in the System tab. This shortcut launches Adaptec Storage Manager using Mozilla.

Unless the controller driver was installed as part of this installation, you do not need to restart your computer.

10. Remove the product installation CD.

Your computer must have a Web browser supporting JavaScript and cookies. To use Adaptec Storage Manager, you need to log on to your computer with root privileges.

C-4. Using Adaptec Storage Manager – Browser

Edition

Overview

This chapter describes how to use Adaptec Storage Manager – Browser Edition to manage arrays.

(*Note: Your controller may not support all of the features described. In most cases if a feature is not supported by your controller, the feature does not appear in the interface.)

With Adaptec Storage Manager, you can:

* Locally manage a system containing a supported Adaptec RAID controller that has Windows or Linux and a supported browser.

* Remotely manage any system containing a supported Adaptec RAID controller that has Managed System Components (see the section regarding Typical, Custom, and Compact Installations). You can manage a system remotely from a system that does not contain a RAID controller.

These same Windows and Linux systems can also be managed remotely by either of these methods:

* Installing Adaptec Storage Manager on the remote system.

* Directing the browser on the remote system to the system you want to manage.

(*Note: To manage an array remotely from a Linux system, install Adaptec Storage Manager on the system and use the Adaptec-supplied version of Mozilla as the browser.)

Architecture Overview

A locally managed system requires all of these components:

* A supported Web browser, which should already be installed on the system.

* The Adaptec Web service which supplies content displayed on the Web browser.

* An Adaptec-supplied storage agent.

A remotely managed system requires all of these components:

* The remote system must contain a browser.

* The storage agent must always be installed on the system with the RAID controller installed.

* Remote and managed systems must have a TCP/IP connection.

The Web service can be installed on the same remote system as the browser, the system with the RAID controller installed, or a third system.

Communication security is ensured because Secure-HTTP

(S-HTTP) or SSL protocols are used to encrypt all transmitted data. Connection over an Ethernet network, a corporate WAN, or VPN are supported.
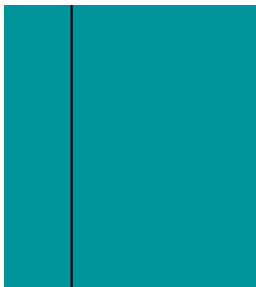
Logging In

To login:

1. Start Adaptec Storage Manager – Browser Edition.

* In Windows, click Start > Programs > Adaptec Storage Manager > Adaptec Storage Manager – Browser Edition.

* In Linux, click Start > System > Adaptec Storage Manager.

The Login screen appears.

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2. Enter the host name or IP address of the system you want to manage and the username and password you would use to log into that system.

3. Click Login.

(*Note:

When running Adaptec Storage Manager for the first time:

* You need to install a security certificate if you chose not to during the installation process. For instructions see the section-"Installing a Security Certificate."

* You are asked to register your software. For instructions see the section-"Registering Your Software".

To log in from any system with a Web browser:

1. Start the Web browser application and type the IP address for the system you want to access in the address bar and press Enter. For example, https://10.6.3.14:3513/adaptec.

When connection to the remote system is established, the System Login screen appears.

(*Note: If you are using a proxy server to access the Internet, you must bypass the proxy server to access the Adaptec Storage Manager Web server. See the section-"Configuring Internet Browsers on Windows" for details.)

2. Enter the host name or IP address of the system you want to manage and the administrative username and password that you would normally use to log into that system.

3. Click Login.

Installing a Security Certificate

If you chose not to install a security certificate when you installed Adaptec Storage Manager – Browser Edition, you must install the certificate when you run the application for the first time.

To create the certificate:

1. When the Security Alert window appears, click View Certificate.

2. On the Certificate window, click Install Certificate.

3. On the Certificate Import wizard window, click Next. The Certificate Import wizard window's contents change.

4. Accept the default, Automatically select the certificate store, and click Next.

5. On the root Certificate Store window, click Yes.

Another small Certificate Import wizard window appears.

6. Click OK. The Certificate window mentioned in Step 2 reappears.

7. Click OK. You are returned to the Security Alert window from Step 1.

8. Click Yes to finish the creation and storage of the certificate.

Registering Your Software

After installing and creating a security certificate, you are asked to register the product. If you want click Register Now, your computer must have an Internet connection. If you need to delay registration, click Register Later. If you choose Register Later, you will be prompted to register the application the next time you run it.

The Basics

An example of a typical Adaptec Storage Manager – Browser Edition screen is shown below.

(*Note: Depending on your operating system, browser, and color scheme you may notice some differences between this illustration and your screen.)

The action buttons are:

* Logout—Selecting Logout ends your session and returns you to the Login screen.

* Rescan—Used to rescan the configuration of the system. Typically, when a rescan is required, it occurs automatically; for example, after an array is created.

However, the system configuration can change without Adaptec Storage Manager being notified. For example, drives that are inserted or removed from a nonintelligent enclosure, or an enclosure powered on after you logged into Adaptec Storage Manager would not be displayed unless you manually rescan.

The remaining buttons open additional windows that provide more detailed information, and allow you to perform actions or change settings on a specific aspect of your storage subsystem. These are:

*   Events

*   Options

*   Help

*   Properties

*   Tasks

Immediately following the header frame is a controller information line including the model number of the first Adaptec RAID controller found in the system, and the amount of cache memory (if any) installed on that controller.

Beneath the controller information are Physical Devices and Logical Devices views that show connected devices and existing arrays on this controller. Controller information and device views are repeated for each additional Adaptec RAID controller in the system.

Select the controller by clicking anywhere on the controller information. When the controller is selected, the Events, Properties and Tasks buttons change from blue to amber, indicating that clicking any of them will display an additional window with information and options specific to this controller.

Pop-Up Tool Tips

If you position the cursor over a device or button a pop-up tool tip appears. For buttons, the tips contain helpful information about the function of the button, while for devices they display additional information.

Physical Devices

The Physical Devices view displays information about the drives and enclosures attached to the Adaptec RAID controller. The devices are shown organized by the channel or port that they are connected to and shown in numerical order.

The display for each channel includes information on maximum speed capability, the number of the channel on the controller, and the number of devices found (excluding the SCSI controller).

Selecting a channel or device will turn the Events, Properties, and Tasks buttons amber. This indicates that clicking any of these buttons will display an additional window with information and options specific to that device or channel.

At the top of the Physical Devices view, grouped to the right of View, are three view selection buttons. These buttons select the physical devices connected to this controller.

Changing How Drives are Displayed

By default, the Physical Devices displays a condensed view of the controller configuration that hides detailed information about the drives. More information is available by either positioning the mouse pointer over the device or clicking on the arrowhead to the left of a row of devices.

The selected display mode button will appear in a lighter shade of blue than the other two buttons. The default display is the Text Description View, but in the condensed view used when Adaptec Storage Manager is loaded, the display is the same in all three modes.

If you change the display mode by selecting one of the other view buttons, a yellow arrow flashes to the left of any devices where the condensed display prevents omits information.

An icon is always the first entry on each device line. The ⬛ icon is used to represent a hard disk drive. If a + symbol appears with the hard disk drive icon ⬛, , the drive is a hot spare. Different icons are used to represent other devices.

View

T is the default display mode and when expanded, will show the following information about each device:

* Capacity of the drive

* Drive manufacturer and model number

* SCSI drive ID, or Serial ATA port number

When expanded, the Full Size Capacity View button and the Relative Size Capacity View button represent each drive as a bar. A drive that is not used as part of any array is shaded blue surrounded by a dotted line.

 displays a full-length bar for each drive, regardless of capacity.

 displays a bar for each drive, with the largest capacity drive full-length and the other drives proportional to the drive capacity, relative to the largest drive.

Any part of a drive used in an array is shown as a gray segment within the bar. Selecting any gray segment will highlight it in amber, and in the Logical Devices view, highlight the array of which this segment is a member.

In either the Full Size Capacity View or the Relative Size Capacity View, a small portion at each end of the drive may be shown in dark gray.

The segment at the end of the drive may vary in size from drive to drive because, in addition to the RAID signature, the controller may also limit the usable capacity of each drive.

This is done because hard disk drives of apparently the same capacity from different manufacturers, or even different models from the same manufacturer, actually vary slightly in the true capacity available. Although, in normal operation this is not an issue, it can be when assigning hot spares or replacing a failed drive.

If the controller used the maximum capacity of each drive and a hot spare or replacement drive was just a few megabytes smaller, it would not be able to replace the failed drive. By rounding drive capacities down to the nearest 2 MB, this possibility is effectively eliminated.

Logical Devices

As described earlier, when Adaptec Storage Manager loads, the Logical Devices view is expanded and you can see the arrays present on the controller.

At the top of this view are the following buttons: Create, Modify, and Delete. Each button opens a wizard for the corresponding function.

Modify allows you to:

* Change an array from one RAID level to another

* Expand an array

* Change the stripe size for a RAID 0

For detailed instructions on using these buttons, refer to the online Help. The main area of the Logical Devices view is used to display the arrays on this controller. It defaults to a condensed view of top-level arrays. (*Note: The Options button allows you to display second-level arrays if your controller supports them.)

In this condensed view, the RAID level of each device, as well as whether it is protected by a hot spare, is visible.

If a global hot spare exists, all arrays that the hot spare is large enough to protect will show as protected.

In the expanded view, the icons for the arrays are arranged vertically and alongside them are the capacity, name, and type of array.

Selecting an array by clicking on it will highlight the following in amber:

* All the drives or segments that form the array in the Physical Devices view.

* The Events, Properties, and Tasks buttons in the header frame. Selecting any of these three buttons displays a new window with additional information and options specific to that array.

(*Note: For Windows Server 2003 only—to see animated icons on Adaptec Storage Manager - logical devices, go to Internet Explorer Properties/ Advanced/Multimedia, and select the Play animations in Web Pages option.)

C-5 Adaptec RAID Configuration Utility

The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, and initialize drives.

A. Managing Arrays

Select the Manage Arrays option to view array properties and members, and delete arrays. The following sections describe these operations in greater detail.

Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press Ctrl+A.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays.

4. From the List of Arrays dialog box, select the array you want to view and press Enter.

The Array Properties dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.

5. Press Esc to return to the previous menu.

Deleting Arrays

 (**Caution**: Back up the data on an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.)

To delete an existing array:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Manage Arrays.

4. Select the array you wish to delete and press Delete.

5. In the Array Properties dialog box, select Delete and press Enter. The following prompt is displayed:

Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):

RAID 1 only—the following prompt is also displayed:

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

6. Press Yes to delete the array or partition or No to return to the previous menu.

7. Press Esc to return to the previous menu.

B. Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are not initialized are shown in gray and cannot be used. See Initializing Disk Drives.

To create an array

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. From the ACU menu, select Create Array.

4. Select the disks for the new array and press Insert. To deselect any disk, highlight the disk and press Delete.

5. Press Enter when both disks for the new array are selected. The Array Properties menu displays.

Assigning Array Properties

(*Note: Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. Instead, use Adaptec Storage Manager - Browser Edition.)

To assign properties to the new array:

1. In the Array Properties menu, select an array type and press Enter. Note that only the available array types, RAID 0, RAID 1, and RAID 10, are displayed. Each of these types requires two drives.

2. Type in an optional label for the array and press Enter.

3. For RAID 0, select the desired stripe size. Available stripe sizes are 16, 32, and 64 KB (default).

(*Note: Adaptec recommends that you do not change the default.)

4. Create RAID via allows you to select between the different creation methods for RAID 0, RAID 1, and RAID 10. The following table gives examples of when each is appropriate.

RAID level	Create via	When appropriate
RAID 0	No Init	Creating a RAID 0 on new drives.
RAID 0	Migrate[1]	Creating a RAID 0 from one new drive and one drive with data you wish to preserve.
RAID 1 RAID 10	Build[1]	Any time you wish to create a RAID 1 or RAID 10, but especially if you have data on one drive that you wish to preserve.
RAID 1 RAID 10	Clear	Creating a RAID 1 or RAID 10 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1 RAID 10	Quick Init	Fastest way to create a RAID 1 or RAID 10. Appropriate when using new drives.

Note 1. If you select Migrate for RAID 0, or Build for RAID 1 or RAID 10, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.

(*Notes:)

* Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

* If you stop the Build or Clear process on a RAID 1 or RAID 10 from ACU you can only restart it from Adaptec Storage Manager -Browser Edition. (See C-4 for details.)

* A RAID 1 created using the Quick Init. Option may return some data if you later run a consistency check. This is normal and is not a cause for concern.

* The ACU allows you to use drives of different sizes in a RAID 1 or RAID 10. However, during a build operation , only the smaller drive can be selected as the source or first drive.

* When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

* Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

(**Caution**: Do not interrupt the creation of a RAID 0 using the Migrate option. If you do, there is no way to restart, and no way to recover the data that was on the source drive.)

5   When you are finished, press Done.

C. Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array, or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

 (**Caution**: Initializing a disk overwrites the partition table on the disk and makes any data on the disk unaccessible. If the drive is used in an array, you may not be able to use the array again. Do not initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, see the section-"Viewing Array Properties".)

To initialize drives:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Array Configuration Utility (ACU).

3. Select Initialize Drives.

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press Insert.

5. Repeat Step 4 so that both drives to be initialized are selected.

6. Press Enter.

7. Read the warning message and ensure that you have selected the correct disk drives to initialize. Type Y to continue.

Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your computer and press Ctrl+A when prompted to access the ARC utility.

2. From the ARC menu, select Disk Utilities.

3. Select the desired disk and press Enter. You are offered the following options:

* Format Disk—Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

 (**Caution:** Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.

* Verify Disk Media—Scans the media of a disk drive for defects.

C-6 Installing the Operating System and other Software Programs

After all the hardware has been installed, you must first install the operating system, and then, other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.

Driver/Tool Installation Display Screen

(*Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.)

Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Supero Doctor III Interface Display Screen-I (Health Information)

Supero Doctor III Interface Display Screen-II (Remote Control)

(*Note: SD III Software Revision 1.0 can be downloaded from our Website at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/ Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend Supero Doctor II.)